



INFLUENCE OF SOME FACTORS ON THE INCIDENCE OF PYOMETRA IN THE BITCH

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Summary

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The aim of the present study was to determine the influence of breed, age, season, mating, pregnancy, progestin contraceptive treatment and the onset time of the disease after the last heat on the incidence and epidemiology of canine pyometra in Bulgaria. The investigation included 217 bitches suffering from pyometra. We found that the disorder was most often observed in 7-year-old, mixed breed bitches, most frequently in September and 4 weeks after the heat.

Key words: age, bitch, breed, incidence, pyometra, season

INTRODUCTION

Pyometra is characterised by uterine bacterial infection with pus accumulating in the uterus and systemic illness (Borresen, 1975). It is the most frequent disease of the reproductive tract in bitches and of great practical importance (Kempisty *et al.*, 2013). Affected animals are mainly older, over eight years of age (Egenvall *et al.*, 2001). Usually pyometra occurs during the luteal phase following estrus (Blendinger *et al.*, 1997), although anestrus bitches also can be diagnosed with pyometra (approximately one third of the total cases) (Noakes *et al.*, 2001).

Canine pyometra should be included in the differential diagnosis for any intact

bitch, regardless of the presenting signs (Smith, 2006). Bitches with pyometra may be either with or without vaginal discharge (open-cervix or closed-cervix pyometra) (Verstegen *et al.*, 2008).

The disease is common in countries where neutering healthy dogs is not generally practiced (Egenvall *et al.*, 2001; Ortega-Pacheco *et al.*, 2012). Despite modern treatment routines, the mortality rate due to pyometra is still approximately 3–4% (Egenvall *et al.*, 2001).

The aim of the present study was to determine the influence of breed, age, season, mating, pregnancy, progestine contraceptive treatment and the onset time of the

disease after the last heat on the incidence of pyometra in bitches in Bulgaria.

MATERIALS AND METHODS

The investigation included 217 bitches from 48 breeds, aged 1–17 years, presented at the Small Animal Clinic of the Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria. Data concerning breed, age, mating, pregnancy, progestine contraceptive treatment and the onset time of the disease after the last heat were collected from the patient registry between 2006–2014.

All the bitches were brought to the clinic because of general malaise and/or vulvar discharge. Some of the animals were treated medically and others – surgically by performing ovariohysterectomy.

The results of our trial were expressed as means±SD and were analysed by non-parametric analysis for comparison of proportions based on Student's t-criterion (StatSoft 1984-2000 Inc. Copyright 1990-1995, Microsoft Corp.). $P \leq 0.05$ was considered significant.

RESULTS

The age of animals varied from 1 to 17 years (mean 7.55 ± 3.45 years). Seven-year-old bitches made up to 11.98% of all cases (Fig. 1). The onset time of pyometra was most frequently 4 weeks after the last heat (33.18% of all cases). When the animals were brought to the clinic, 87.1% of them were in diestrus (within 2 months after the heat) and the other 12.9% were in the anestrus stage ($P < 0.001$).

Analysing the morbidity of pyometra we found that mixed breed bitches were 14.75%, Miniature Pinschers – 8.29% and Rottweilers – 7.37% of all cases (Table 1). Small breeds such as Bolognese, Miniature Pincher and Pekingese developed pyometra later in their life (12.57 ± 2.44 , 8.44 ± 4.12 and 8.22 ± 3.80 years respectively) compared to large breed dogs such as Caucasian Shepherd and Bulgarian Shepherd (6.00 ± 3.24 and 6.25 ± 1.67 years respectively). In our investigation Siberian Husky bitches were the first to develop the disease at 5.67 ± 3.98 years of age.

Seasonal patterns of pyometra showed that most frequently the disease occurred

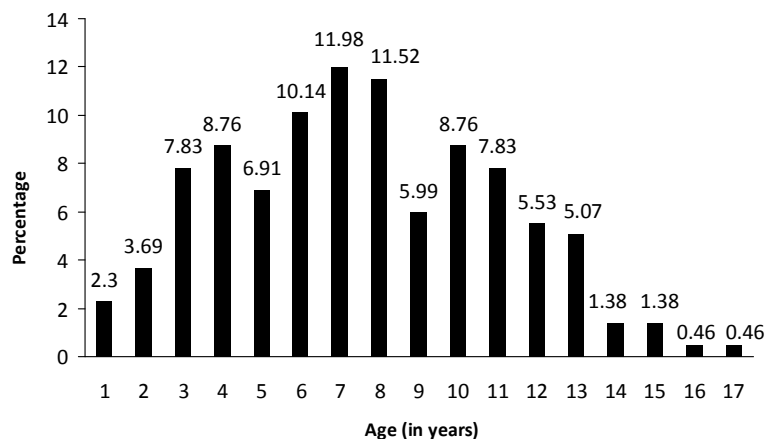


Fig. 1. Morbidity of pyometra depending on the age of the bitches.

Table 1. Selected data from the signalment (age, season, mating, pregnancy, contraceptive treatment, onset time after last heat) in 10 breeds most commonly affected with pyometra

Breed	Number	Percentage	Age, years	Most frequent month of the year	Weeks after heat	Mating at last estrus	Contraceptive treatment	Nulliparous
Mixed breed	32	14.75	7.22±3.37 (2-15)	May, October	6.34±2.81	6 (18.75%)	6 (15.62%)	15 (46.87%)
Miniature Pinscher	18	8.29	8.44±4.12 (1-15)	April	8.52±12.15	4 (22.22%)	1 (5.55%)	11 (61.11%)
Rottweiler	16	7.37	7.31±1.92 (4-11)	July, June	9.94±12.92	2 (12.5%)	1 (6.25%)	8 (50.00%)
Bolognese	14	6.45	12.57±2.44 (7-17)	January	9.93±13.41	1 (7.14%)	3 (21.42%)	11 (78.57%)
German Shepherd	12	5.53	8.42±2.15 (4-12)	May	7.94±8.01	2 (16.66%)	–	7 (58.33%)
Pitbull	10	4.61	7.60±2.72 (4-13)	September	8.05±11.43	1 (10.99%)	–	5 (50.00%)
Pekingese	9	4.15	8.22±3.80 (2-13)	May, March	4.94±4.47	–	4 (44.44%)	6 (66.66%)
Caucasian shepherd	9	4.15	6.00±3.24 (3-11)	November	6.00±4.66	3 (33.33%)	1 (11.11%)	7 (77.77%)
Bulgarian shepherd	8	3.23	6.25±1.67 (4-9)	September	3.26±1.03	2 (25.00%)	2 (25.00%)	7 (87.50%)
Siberian Husky	6	2.76	5.67±3.98 (1-11)	September	5.00±2.45	–	–	4 (66.66%)

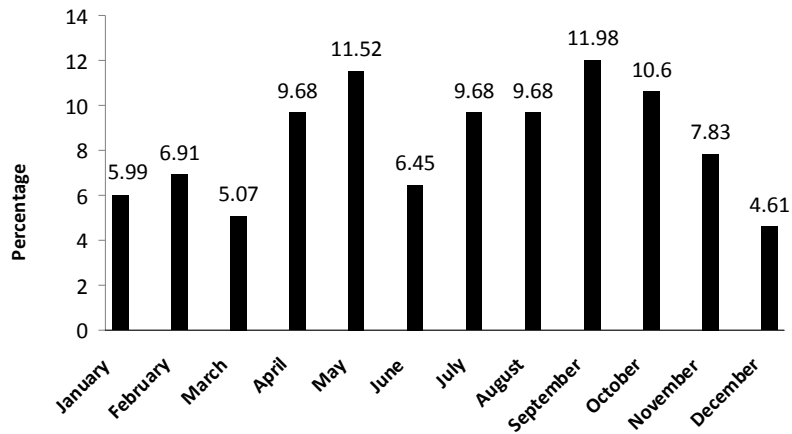


Fig. 2. Influence of season on pyometra morbidity in bitches.

in September (11.98%), May (11.52%) and October (10.6%). The lowest number of cases was observed in the winter (Fig. 2).

During the last estrus 16.59% of the animals were mated, while the other 83.41% had no sexual contact ($P < 0.001$). Only 10.6% of bitches had had a previous progesterone contraceptive treatment and the other 89.4% had not ever been treated with any contraceptives ($P < 0.001$). Of all dogs, 62.21% were nulliparous and 37.79% were multiparous ($P < 0.001$).

DISCUSSION

Our investigation examined some specific characteristics of the epidemiology of canine pyometra in Bulgaria. This disorder of the uterus in nonpregnant, sexually mature bitches is usually diagnosed from 4 weeks to 4 months after the end of estrus (Smith, 2006). We also observed it more frequently in diestrus bitches, when progesterone secretion resulted in endometrial proliferation and uterine glandular secretion, accompanied with suppression of immune responses, decreased myo-

metrial contraction and closure of the cervix (Borresen, 1975; Parvanov & Stefanova-Gerganova, 1998; Smith, 2006). Although the association between pyometra and diestrus has been well established, the precise mechanism is still not clear (Borresen, 1975). We also registered the disease in anestrus bitches. Leukocyte inhibition in the progesterone-primed uterus often supports bacterial growth. All these effects are cumulative and each estrous cycle is exacerbating this uterine pathology (Sugiura *et al.*, 2004).

According to Laurusevicius (2009), pyometra is most often observed in eight years old bitches, a month after the heat, in July and August and the breed most frequently affected is Rottweiler. Our results confirm that canine pyometra is more often observed in older and most frequently in 7–8 years old bitches (Chastain *et al.*, 1999; Egenvall *et al.*, 2001), but as could be seen from Fig. 1, there was also a significantly high percentage of morbidity in 3- and 4-year-old animals. Because of different age patterns of the risk of developing pyometra, the optimal age for elective spaying differs among breeds.

There is an increased risk for the disease in seventeen breeds, whereas the Wire-Haired Dachshund and mixed breed were at a lower risk of developing it (Egenvall *et al.*, 2001). In contrast to previous studies (Niskanen & Thrusfield, 1998; Laurusevicius, 2009), we diagnosed most frequently pyometra in mixed breed bitches (14.75%) and our results confirmed the findings that Rottweilers were one of the most affected breeds (Niskanen & Thrusfield, 1998; Hagman, 2004; Smith, 2006; Laurusevicius, 2009). These breeds may have a higher genetic predisposition for developing pyometra than other breeds so the possibility of instituting breeding programmes for disease control might be considered.

Analysis of seasonal occurrence of pyometra showed that the biggest number of cases was registered in September (11.98%) and May (11.52%), i.e. in the autumn and spring, while Laurusevicius (2009) reported highest morbidity of pyometra in the summer. In our opinion, this was due to the local geographical factors.

According to Niskanen & Thrusfield (1998), no significant risk-enhancing effect of progestin treatment and mating for developing pyometra was detected. Our results confirmed this so we conclude that the possible risk was probably low. We also found that nulliparous bitches were at a moderately higher risk of developing pyometra (almost 2:1), as already observed (Noakes *et al.*, 2001; Verstegen *et al.*, 2008).

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